7. Static system Estimation

1. Model: ,
2. Measurements:

* Simple Estimator

1. Batch type
2. Recursive type(real time)

Then

* Kalman’s weighting
* Assume

1. Assume the estimator is unbiased
2. Minimum variance, find the optimal gain
3. In conclusion the minimum variance estimator is

* (7.13) is called Riccati equation.

1. Dynamic Discrete system Estimation

* Model

Find the estimator of

1. Simple average: moving average filter:
   1. Example:

3-point average(Moving)

* point moving average: (moving window, width =
  1. Matlab command

Let

filter(a,b,x):

% MOVING Window size = 40

Win = 40;

a = 1;

b= 1/Win\*ones(1,Win);

MovFilter =filter(b,a,x);

1. Constant velocity model – simple (alpha, beta traker)

-.dynamics

-. Measurement: position measured.

🡪 estimate velocity

2.1) Two steps

Initial guess

-. Prediction

-. Correction( Measurements): ..wait until the measurement

+ innovation

+

+

At n= 2

-. Prediction

-. Correction( Measurements): ..wait until the measurement

+ innovation

+

+

At n= 3,… repeat…

* How to pick-up alpha, beta